



# CBCS SCHEME

15CT761

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020  
**Solid Waste Management**

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain the functional elements of Solid Waste Management. (06 Marks)  
b. Estimate the overall moisture content and density of 1000kg solid waste sample from the following data:

Component	Food waste	Paper	Cardboard	Plastic	Glass	Wood	Others
% by mass	16	36	08	05	15	05	15
% moisture content	70	06	05	02	06	20	03
Density kg/m <sup>3</sup>	290	85	20	65	105	240	90

(10 Marks)

OR

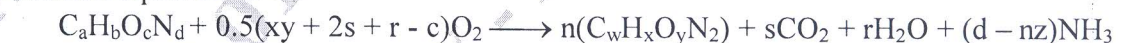
- 2 a. Discuss on the properties of Solid Waste. (06 Marks)  
b. Estimate the density of a solid waste sample on as discarded basis.

Component	% by mass	Density (kg/m <sup>3</sup> )
Food waste	15	290
Paper	45	85
CB	10	50
Plastics	10	65
Garden trimming	10	105
Wood	5	240
Tin cans	5	90

(10 Marks)

### Module-2

- 3 a. Estimate the amount of oxygen required to oxidize 1000 kg of organic waste aerobically assume that initial composition of organic matter is given by  $[C_6H_7O_2(OH)_3]_5$  and final composition of residual organic matter as  $[C_6H_7O_2(OH)_3]_2$  and that 400kg of material remains after oxidation. Assume initially 1.23 moles of organic matter present. The aerobic reaction equation as



where  $r = 0.5[s - nx - 3(d - xz)]$  and  $s = (a - nw)$ .

(10 Marks)

- b. With help of neat sketch explain stationary container system of collection of solid waste.

(06 Marks)

OR

- 4 a. Estimate the quantity of solid waste generated per annum in a municipal area having 1-lakh dwelling. Assume each person produces 350g of solid waste per day. Also work out the number of collectors required per day, if a collector attends 12 calls per hour and works for 8 hours a day. (Assume 5 persons/dwelling). (10 Marks)

- b. Explain the different ways of component separation. (06 Marks)

**Module-3**

- 5 a. Explain with a neat sketch Municipal Incinerators. (10 Marks)  
 b. Briefly discuss on the 3TS in incineration process of Solid Waste. (06 Marks)

OR

- 6 a. Mention the various equipments used in emission control for municipal incinerators explain one in brief. (10 Marks)  
 b. What is pyrolysis and explain in brief. (06 Marks)

**Module-4**

- 7 a. List the design considerations for anaerobic composting. (10 Marks)  
 b. Determine the amount of air required to oxidize completely tones of waste having the chemical equation.



OR

- 8 a. Mention the different types of the landfill. Discuss any one in detail with sketch. (10 Marks)  
 b. Determine the landfill area for a municipality with a population 50,000 given that waste generation of 350 g/person/day. Compacted density of landfill = 504 kg/m<sup>3</sup>. Average depth = 3m. (06 Marks)

**Module-5**

- 9 a. List the factors affecting the selection of sets of open dumping. (06 Marks)  
 b. Mention the advantages and disadvantages of ocean disposal. (10 Marks)

OR

- 10 a. Enumerate on plastic wastes, environmental significance. (10 Marks)  
 b. List the various opportunities in Reuse and Recycling in industries. (06 Marks)

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